August 18, 2021

The Honorable Chair and Members of the
Hawai'i Public Utilities Commission
465 South King Street
Kekuanao'a Building, First Floor
Honolulu, Hawai'i 96813

Dear Commissioners:

Subject: Docket No. 2020-0140
For Approval of a First Amendment to Power Purchase Agreement for Renewable Dispatchable Generation with Mahi Solar, LLC
Hawaiian Electric Subsequent Filing of Exhibits

In the letter filed by Hawaiian Electric Company, Inc. ("Hawaiian Electric" or the "Company") on July 30, 2021 in the subject proceeding, the Company indicated that it will submit the Project Benefits Analysis and Greenhouse Gas ("GHG") Emissions Analysis to the Commission by August 19, 2021.[1] Accordingly, the Company respectfully submits as Exhibits B, C, and D to the request for approval of a First Amendment to Power Purchase Agreement ("PPA") for Renewable Dispatchable Generation with Mahi Solar, LLC ("Project") its Renewable Portfolio Percentage (Exhibit B), Project Benefits Analysis (Exhibit C), and GHG Emissions Analysis (Exhibit D), which are hereby incorporated into the July 30, 2021 request.[2] A summary of these exhibits is provided below.

I. Renewable Portfolio Percentage

The Project will assist Hawaiian Electric in satisfying its Renewable Portfolio Standard ("RPS") requirements, by increasing the Project's contribution to RPS, as further shown in **Exhibit B**. The Project's annual RPS contribution on average for the accelerated Guaranteed Commercial Operations Date ("GCOD") is 3.52 percentage points over the 25-year term of the PPA and will increase the Hawaiian Electric Companies'[3] annual consolidated RPS on average 2.70 percentage points. For reference, the Project's annual RPS contribution on average for the

[1] See July 30, 2021 Letter at 6.

[2] In accordance with Order No. 37043 *Setting Forth Public Utilities Commission Emergency Filing and Service Procedures related to COVID-19* (non-docketed), issued by the Commission on March 13, 2020, the Company is serving this filing on the Consumer Advocate and Counsel for Mahi Solar, LLC via email.

[3] The "Hawaiian Electric Companies" are Hawaiian Electric, Hawai'i Electric Light Company, Inc., and Maui Electric Company, Limited.

original GCOD is 3.51 percentage points over the 25-year term of the PPA and will increase the Hawaiian Electric Companies' annual consolidated RPS on average 2.69 percentage points.

II. Project Benefits Analysis

The PPA Amendment is expected to provide bill savings to Hawaiian Electric's customers over the term of the contract, as further shown in **Exhibit C** to this filing.[4] It is estimated that, as a result of the PPA Amendment, a typical residential Hawaiian Electric customer consuming 500 kWh per month could save approximately $0.59 per month on average during the term of the PPA. For reference, a typical residential Hawaiian Electric customer consuming 500 kWh per month could save approximately $0.71 per month on average during the term of the PPA under the original GCOD and original Lump Sum Payment. Over the life of the PPA, the Net Present Value ("NPV") of the Total System Costs for the Project's accelerated GCOD is $12,688,838,863 ($15,188,765 more than the NPV of the Total System Costs under the Project's original GCOD).

III. Greenhouse Gas Analysis

A lifecycle GHG emissions analysis for the project was performed by Ramboll US Consulting, Inc. ("Ramboll"), as provided in **Exhibit D**. The expected Project Lifecycle GHG Emissions do not change as a result of the accelerated schedule, as the accelerated Project schedule does not impact Project Lifetime, Project Lifetime Production Capacity or Project design, construction or operations activities, except for the three month shift in the expected start of operations. Therefore, the Project Lifecycle GHG Emissions are the same as the original Mahi Solar GHG Analysis, submitted as Exhibit 5 to the Application filed on September 25, 2020. Based on the original Project Lifecycle GHG Emissions and the updated avoided fuel consumption projection, Ramboll has estimated that the Net Lifecycle Emissions Redcution associated with the accelerated GCOD for the Project to be 2,984,313 metric tons ("MT") carbon dioxide equivalents ("CO_2e"), or 440 kilograms CO_2e per megawatt hour ("kg CO_2e/MWh").

As demonstrated by the above GHG analysis results, approval and completion of the Project would result in a significant reduction in lifecycle GHG emissions relative to the baseline without the Project.

In addition to the benefit of accelerating the GCOD of the Project by the three months, the Company respectfully requests that the Commission consider the benefits set forth in this

[4] Exhibit C contains restricted confidential information that is being provided to the Commission and the Consumer Advocate pursuant to Protective Order No. 37370, issued October 16, 2020 in this proceeding. Attachment 1 to this letter provides the justification for the confidential and restricted treatment of this information.

filing when evaluating whether the agreed upon First Amendment to the PPA is in the public interest.

Sincerely,

/s/ Kanoelani S. Kane

KANOELANI S. KANE
Associate General Counsel
Hawaiian Electric Company, Inc.

Enclosures

c: Division of Consumer Advocacy
Counsel for Mahi Solar, LLC

CONFIDENTIALITY JUSTIFICATION TABLE

Pursuant to Protective Order No. 37370, Hawaiian Electric Company, Inc. (the "Company") hereby identifies redacted confidential and/or proprietary information that is being submitted as "confidential information" or "restricted information" and: (1) identifies, in reasonable detail, the confidential information's source, character, and location; (2) states clearly the basis for the claim of confidentiality; and (3) describes, with particularity, the cognizable harm to the producing party or participant from any misuse or unpermitted disclosure of the information. For designations of restricted information, additional descriptions of the cognizable harm are provided.

Reference	Identification of Item	Restricted?	Basis of Confidentiality	Harm
Exhibit C – Project Benefits Analysis	Pricing Evaluations in Exhibit C.	Yes. **Restricted information disclosed only to:** PUC, CA **Restricted from:** Mahi Solar, LLC	Confidential financial and cost information which falls under the frustration of legitimate government function exception of the Uniform Information Practices Act ("UIPA").[1]	Exhibit 3 (Project Benefits Analysis) shows the detailed pricing analysis and associated methodology for the Mahi Solar, LLC utility-scale photovoltaic and energy storage project. The exhibit shows the revenue requirement, avoided revenue requirement, avoided fuel consumption, and typical residential bill impacts of the Mahi Solar, LLC project over the PPA term. Public disclosure of the subject information could harm the Company by placing it at a competitive disadvantage, and may jeopardize the Company's current or future contract negotiations. The Company believes that if the subject information is disclosed to third parties, such information could be used to derive pricing proposals for potential projects and third parties would receive an unfair business advantage resulting in prejudice to the Company and its customers. The Company maintains that the subject information falls under the frustration of legitimate government function exception of the UIPA as disclosure of subject information would impair the Commission's ability to obtain necessary information to properly perform its review of this regulatory proceeding (as the Company would not have submitted the confidential information

[1] Haw. Rev. Stat. § 92F-13(3).

Reference	Identification of Item	Restricted?	Basis of Confidentiality	Harm
				in this docket but for: (1) the governmental function of reviewing the Company's request for approval of the PPA; and (2) the Company's belief and reliance that the information would not be publicly disclosed). The confidential information: (1) has not been previously disclosed or otherwise publicly disseminated; (2) is not of the kind of information that the Company would customarily disclose to the public; and (3) is of a nature that its disclosure could (a) impair the Commission's ability to obtain necessary information from similarly situated parties in the future, and (b) cause substantial harm to the Company and/or its customers as previously described above. **Basis from withholding from Mahi Solar, LLC:** The harms stated above apply to restrict information from Mahi Solar, LLC. In particular, disclosure of the restricted information to Mahi Solar, LLC, which is an independent power producer, could harm the Company by jeopardizing the Company's current or future competitive bidding solicitations, procurements and contract negotiations by being used to derive pricing proposals for potential projects, and by providing an unfair business advantage, resulting in prejudice to the Company and its customers.

Exhibit B

Renewable Portfolio Percentage

Year	Mahi Solar's Impact on Oahu RPS	Mahi Solar's Impact on Oahu RPS	Mahi Solar's Impact on Consolidated RPS	Mahi Solar's Impact on Consolidated RPS
	Original GCOD	Accelerated GCOD	Original GCOD	Accelerated GCOD
2023	0.01%	0.89%	0.01%	0.68%
2024	4.21%	4.21%	3.22%	3.22%
2025	4.09%	4.11%	3.14%	3.14%
2026	4.03%	4.04%	3.09%	3.10%
2027	4.04%	4.02%	3.10%	3.09%
2028	4.00%	4.01%	3.07%	3.08%
2029	3.98%	4.00%	3.06%	3.07%
2030	3.96%	3.96%	3.05%	3.05%
2031	3.93%	3.94%	3.02%	3.03%
2032	3.92%	3.92%	3.02%	3.02%
2033	3.85%	3.86%	2.97%	2.97%
2034	3.86%	3.84%	2.97%	2.95%
2035	3.82%	3.82%	2.93%	2.94%
2036	3.78%	3.77%	2.90%	2.89%
2037	3.75%	3.76%	2.88%	2.88%
2038	3.72%	3.71%	2.85%	2.84%
2039	3.69%	3.70%	2.82%	2.83%
2040	3.44%	3.45%	2.64%	2.64%
2041	3.51%	3.53%	2.69%	2.70%
2042	3.44%	3.44%	2.63%	2.63%
2043	3.38%	3.37%	2.59%	2.58%
2044	3.27%	3.28%	2.50%	2.51%
2045	2.93%	2.93%	2.25%	2.24%
2046	2.88%	2.86%	2.21%	2.20%
2047	2.85%	2.84%	2.19%	2.18%
2048	2.84%	2.18%	2.18%	1.67%
Average	3.51%	3.52%	2.69%	2.70%

Differential Mahi Original GCOD and Mahi 3-Month Accelerated GCOD

System Revenue Requirement NPV Differential

Year	Mahi Original GCOD Total System Costs ($)	Mahi 3-Month Accelerated GCOD Total System Costs ($)	Differential of Total System Cost ($)
	a	b	c = a - b
2023	[redacted]	[redacted]	[redacted]
2024			
2025			
2026			
2027			
2028			
2029			
2030			
2031			
2032			
2033			
2034			
2035			
2036			
2037			
2038			
2039			
2040			
2041			
2042			
2043			
2044			
2045			
2046			
2047			
2048			
NPV	$ 12,673,650,098	$ 12,688,838,863	$ 15,188,765

Differential Mahi Original GCOD and Mahi Accelerated GCOD

O'ahu System Fuel Consumption

Year	LSFO Avoided Fuel Consumption (Barrels)	Diesel Avoided Fuel Consumption (Barrels)	ULSD Avoided Fuel Consumption (Barrels)	Biodiesel Avoided Fuel Consumption (Barrels)
2023	[redacted]			
2024				
2025				
2026				
2027				
2028				
2029				
2030				
2031				
2032				
2033				
2034				
2035				
2036				
2037				
2038				
2039				
2040				
2041				
2042				
2043				
2044				
2045				
2046				
2047				
2048				
Total	99,558	-20,918	478	-91,257

Fuel consumption differential in years beyond 2024 are due to economic dispatch changes in the optimized production simulation modeling random maintenance outages and forced outages.

Differential Mahi Original GCOD and Mahi 3-Month Accelerated GCOD

Typical Residential Bill Impact for Mahi 3-Month Accelerated GCOD

	a	b	c = a - b	d	e = (c/d)/10	f = (500 * e)/100	Mahi Original GCOD	Mahi 3-Month Accelerated GCOD
Year	Mahi Differential Total Revenue Requirement (Current Year $)	Hawaiian Electric Differential Total Avoided Revenue Requirement (Current Year $)	Differential Incremental Revenues Required (Current Year $)	Estimated Hawaiian Electric Sales (MWh)	Differential Estimated Rate Impact (cents/kWh in Current Year $)	Differential Est Impact on Typical Residential Bill of 500 kWh (Current Year $)	Est Impact on Typical Residential Bill of 500 kWh (Current Year $)	Est Impact on Typical Residential Bill of 500 kWh (Current Year $)
2023	$7,475,775			6,366,292		$0.06	$0.20	$0.25
2024	$983,274			6,441,818		$0.09	$0.16	$0.25
2025	$983,274			6,520,703		$0.08	$0.21	$0.29
2026	$983,274			6,599,300		$0.08	$0.06	$0.14
2027	$983,274			6,611,700		$0.10	($0.20)	($0.10)
2028	$983,274			6,645,400		($0.05)	($0.26)	($0.31)
2029	$983,274			6,681,300		$0.09	($0.49)	($0.40)
2030	$983,274			6,753,400		$0.10	($0.39)	($0.29)
2031	$983,274			6,787,600		$0.10	($0.12)	($0.02)
2032	$983,274			6,823,700		$0.09	($0.37)	($0.28)
2033	$983,274			6,878,700		$0.06	($0.24)	($0.18)
2034	$983,274			6,922,700		$0.07	($0.32)	($0.25)
2035	$983,274			6,977,200		$0.06	($0.20)	($0.14)
2036	$983,274			7,058,300		$0.05	($0.23)	($0.18)
2037	$983,274			7,111,800		$0.09	($0.68)	($0.59)
2038	$983,274			7,185,800		$0.12	($0.79)	($0.67)
2039	$983,274			7,285,800		$0.08	($0.90)	($0.83)
2040	$983,274			7,431,700		$0.09	$0.07	$0.16
2041	$983,274			7,512,000		$0.09	($0.26)	($0.18)
2042	$983,274			7,637,300		$0.05	($0.61)	($0.56)
2043	$983,274			7,776,400		$0.09	($1.24)	($1.15)
2044	$983,274			7,945,400		$0.04	($1.66)	($1.62)
2045	$983,274			8,079,300		$0.05	($1.62)	($1.57)
2046	$983,274			8,237,100		$0.06	($2.30)	($2.24)
2047	$983,274			8,396,300		$0.06	($2.82)	($2.76)
2048	($6,492,501)			8,574,400		$1.24	($3.47)	($2.24)

Exhibit D

Mahi Solar GHG Analysis

This lifecycle greenhouse gas emissions ("GHG" or "emissions") analysis ("Analysis") for the Mahi Solar Project ("Project") is being provided pursuant to HRS §269-6(b) and was performed by Ramboll US Consulting, Inc. ("Ramboll"). The Project includes the installation of the following: overhead and underground transmission lines, circuit breakers, solar PV system, battery energy storage system, substation facility, control and monitoring facilities, and relays. Ramboll estimated the total Avoided Lifecycle GHG Emissions and Net Lifecycle GHG Emissions Reduction for the accelerated Guaranteed Commercial Operation Start Date ("GCOD"), which shifts the Project GCOD to an earlier GCOD (adjusted from the original GCOD by 3 months).

The Project Lifecycle GHG Emissions account for all lifecycle stages (raw materials and extraction, transportation, construction, operations & maintenance, and decommissioning & disposal). The expected Project Lifecycle GHG Emissions do not change as a result of this accelerated schedule, as the accelerated Project schedule does not impact Project Lifetime, Project Lifetime Production Capacity or Project design, construction or operations activities, except for the 3-month shift in the expected start of operations. Therefore, the Project Lifecycle GHG Emissions reported here are the same as the original Mahi Solar Analysis GHG published in Docket 2020-0140 Exhibit 5.

Based on the original Mahi Solar GHG Analysis filed with the Commission in Docket 2020-0140 Exhibit 5, Ramboll has estimated that the Project Lifecycle Emissions would result in 330,359 metric tons ("MT") carbon dioxide equivalents ("CO_2e"), or 49 kilograms CO_2e per megawatt hour ("kg CO_2e/MWh"). See Table 1 for a tabular presentation of the estimated emissions.

Ramboll estimated the Avoided Lifecycle GHG Emissions based on the GHG emissions from the combustion of fossil fuels that would occur if the Project were not built. Avoided emissions were analyzed using the same approach as set forth in the original analysis, Docket 2020-0140 Exhibit 5 (Mahi Solar GHG Analysis), and updated projected avoided fuel use, which was provided by Hawaiian Electric for years 2023 to 2048, provided by Hawaiian Electric, and as presented in Exhibit C of this supplemental filing to the Company's Request for Approval of a First Amendment to Power Purchase Agreement for Renewable Dispatchable Generation with Mahi Solar, LLC filed on July 30, 2021. Ramboll focused solely on direct (stack) emissions since those emissions alone are significantly higher than those of the Project, represent the majority of projected GHG emissions from avoided fuel consumption if the Project were not built, and demonstrate the benefits of the Project over the avoided case in terms of GHG emissions. Thus, it was concluded that the further inclusion of indirect GHG emissions from the fossil fuel sources (upstream, operations, or downstream) to the avoided case was unnecessary. The Avoided Lifecycle Emissions are estimated to be 3,314,671 MT CO_2e or 488 kg CO_2e/MWh for the accelerated GCOD for the Project. See Table 2 for a tabular presentation of the estimated emissions.

Estimated Net Lifecycle GHG Emissions are defined as the estimated Avoided Lifecycle GHG Emissions from fossil-fueled plants minus the estimated Lifecycle GHG emissions from the

Project. The lower the Project's Lifecycle GHG Emissions relative to the Avoided Lifecycle GHG Emissions, the higher the Net Lifecycle GHG Emissions reduction.

The Net Lifecycle Emissions Reduction associated with the accelerated GCOD for the Project is estimated to be 2,984,313 MT CO_2e or 440 kg CO_2e/MWh. See Table 3 for a tabular presentation of the estimated emissions.

As demonstrated by the above GHG analysis results, approval and completion of the accelerated Project would result in a significant reduction in lifecycle GHG emissions relative to the baseline without the accelerated Project.

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Table 1
Project Lifecyle GHG Emissions
Mahi Solar Accelerated GHG Analysis
O'ahu, HI

Project Stage	GHG Intensity ($kg\ CO_2e/MWh$)[1]	GHG Emissions ($MT\ CO_2e$)[1]
Total Project Lifecycle	49	330,359

Notes:

1. This table summarizes results from the original Mahi Solar GHG Analysis undertaken to determine Project GHG Emissions, which is included in Docket 2020-0140 Exhibit 5 filed on 9/25/2020. This GHG Analysis is on a total Project basis and results are not shown for each lifecycle stage. The total Project GHG Intensity and Project GHG Emissions accounts for all lifecycle stages (raw materials and extraction, transportation, construction, operations & maintenance, and decommissioning & disposal). The GHG Intensity presents the GHG emission rate relative to the energy produced by the Project.

Abbreviations:

CO_2e - carbon dioxide equivalent

GHG - greenhouse gas

kg - kilogram

MWh - Megawatt hour

MT - metric ton

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Table 2
Avoided GHG Emissions
Mahi Solar Accelerated GHG Analysis
Oʻahu, HI

Project Stage	Direct GHG Intensity (kg CO_2e/MWh)	Direct GHG Emissions[1,2] (MT CO_2e)
Avoided Lifecycle	488	3,314,671

Notes:

1. As set forth more fully in the accompanying letter, the GHG emissions that would result if the Project were not built (referred to as "Avoided GHG Emissions") are calculated based on the combustion emissions of the fuel that would be consumed if the Project were not built, as provided by Hawaiian Electric Company, Inc. (Hawaiian Electric); the Avoided GHG emissions are assumed to equal the Avoided direct generation (i.e., combustion) emissions, and do not account for Upstream or Downstream emissions. This approach is reasonable and commensurate with the level of complexity warranted in this case given that the inclusion of Upstream and Downstream GHG emissions would not change the result of the comparison between the Project and Avoided emissions (i.e., the Project GHG emissions are significantly lower than the Avoided GHG emissions even excluding the Avoided Upstream and Downstream GHG emissions).

2. The Avoided GHG Emissions estimates are based on the most current information including emissions factors available to Ramboll at the time the analysis was completed.

Abbreviations:

CO_2e - carbon dioxide equivalent
GHG - greenhouse gas
kg - kilogram
MT - metric ton
MWh - megawatt hour

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Table 3
Net GHG Emissions Reduction
Mahi Solar Accelerated GHG Analysis
Oʻahu, HI

Project Stage	Net GHG Intensity Reduction (kg CO_2e/MWh)	Net GHG Emissions Reduction (MT CO_2e)[1]
Net Lifecycle	440	2,984,313

Notes:

1. Net Emissions are defined as the Avoided Emissions from Fossil Fueled Plants (referred to as "Avoided GHG Emissions") less the Emissions from the Project (referred to as "Project Emissions").

Abbreviations:

CO_2e - carbon dioxide equivalent
GHG - greenhouse gas
kg - kilogram
MT - metric ton
MWh - megawatt hour

The foregoing document was electronically filed with the State of Hawaii Public Utilities Commission's Document Management System (DMS).